U.S. Army Corps
of Engineers
Wilmington District

February 26, 2003
Presentation in Clarksville, Virginia to the
Bi-State Commission

Overview of and Interlink of John H. Kerr, Philpott, and Private Hydropower Projects in the Roanoke River Basin, Recent Drought Management Practices and a Short Term Outlook

Terry Brown, Water Control Manager

The Wilmington District

Major River Basins and Reservoir Projects Within the Wilmington District

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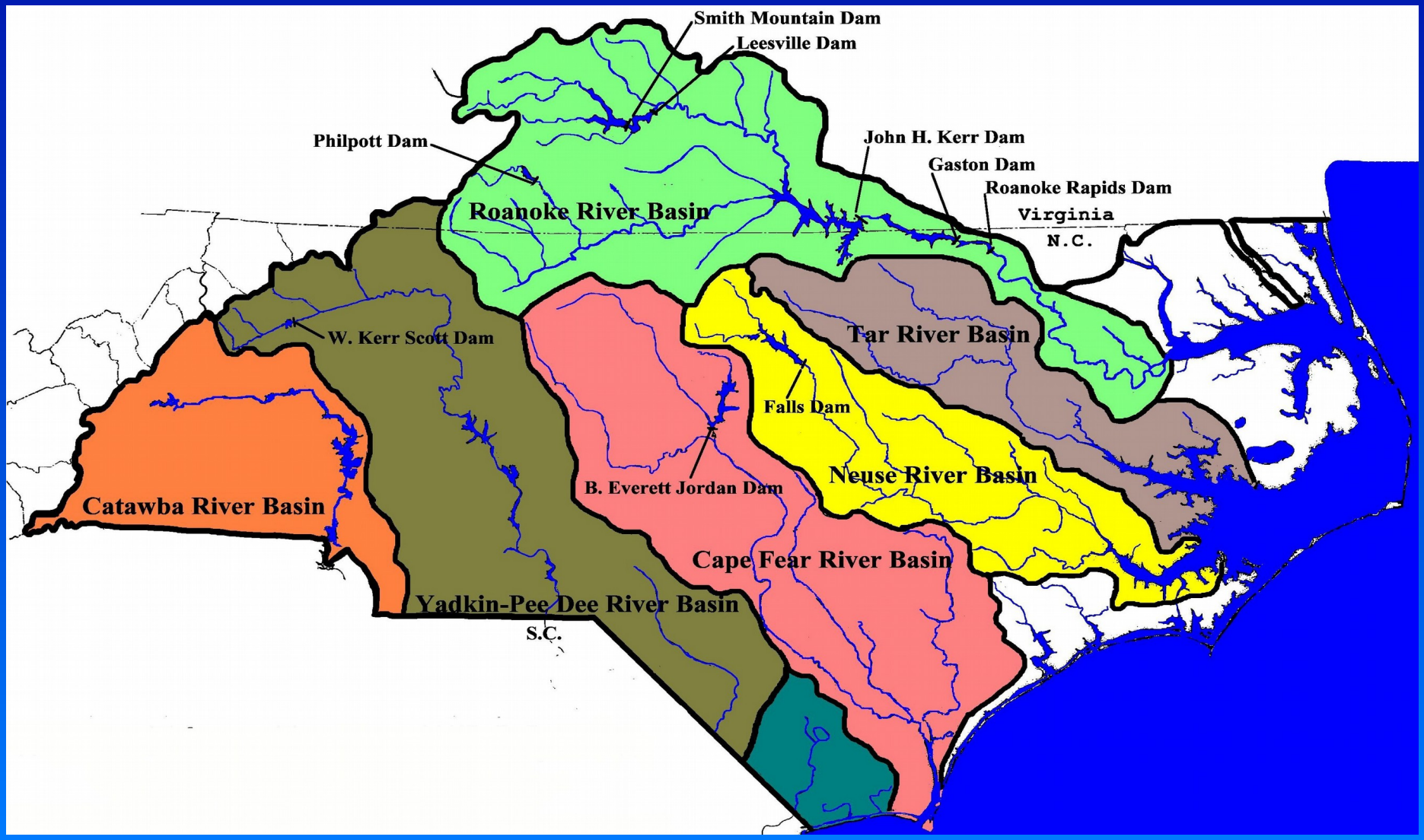

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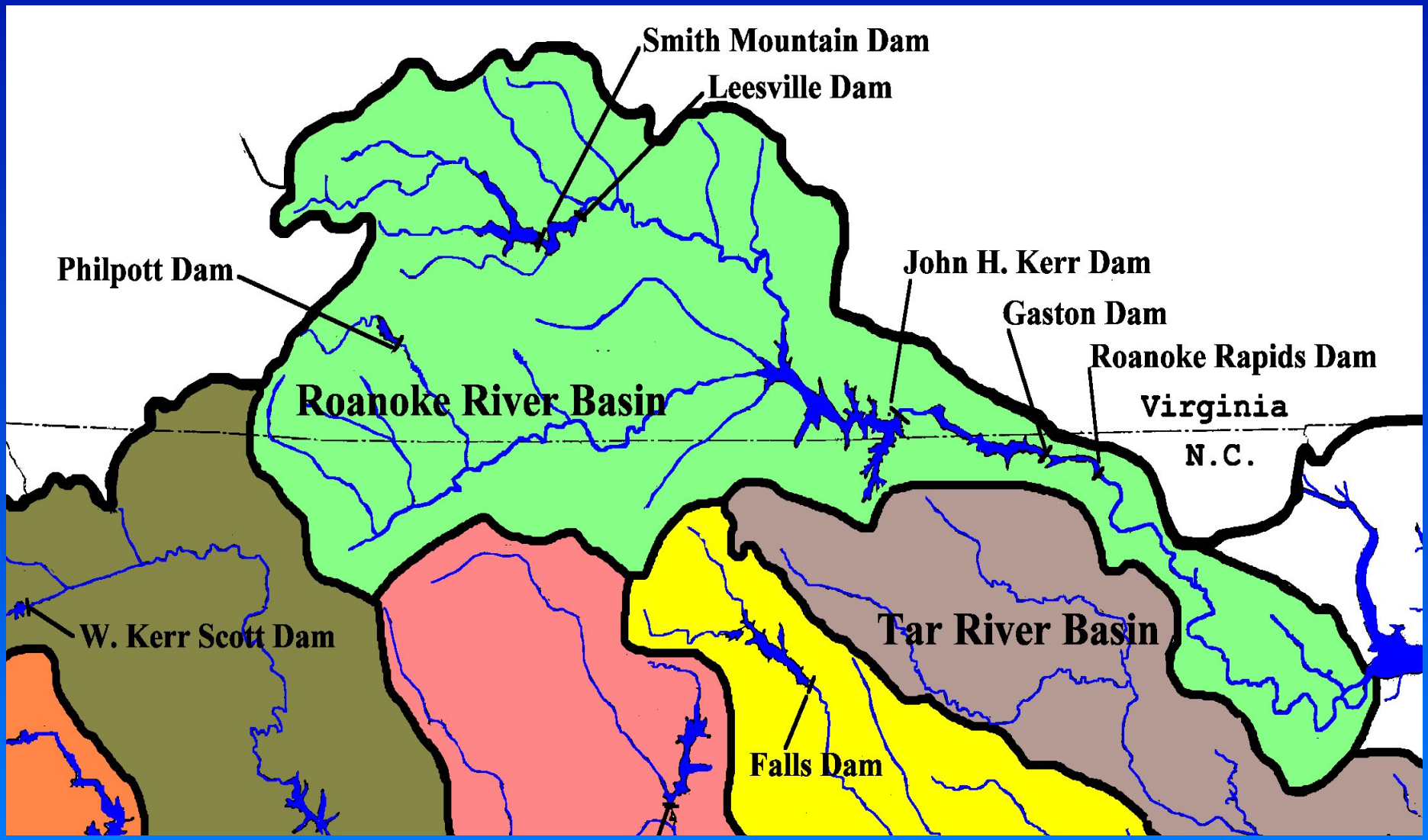
John H. Kerr Dam and Reservoir



Philpott Dam and Lake

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John H. Kerr Dam and Reservoir

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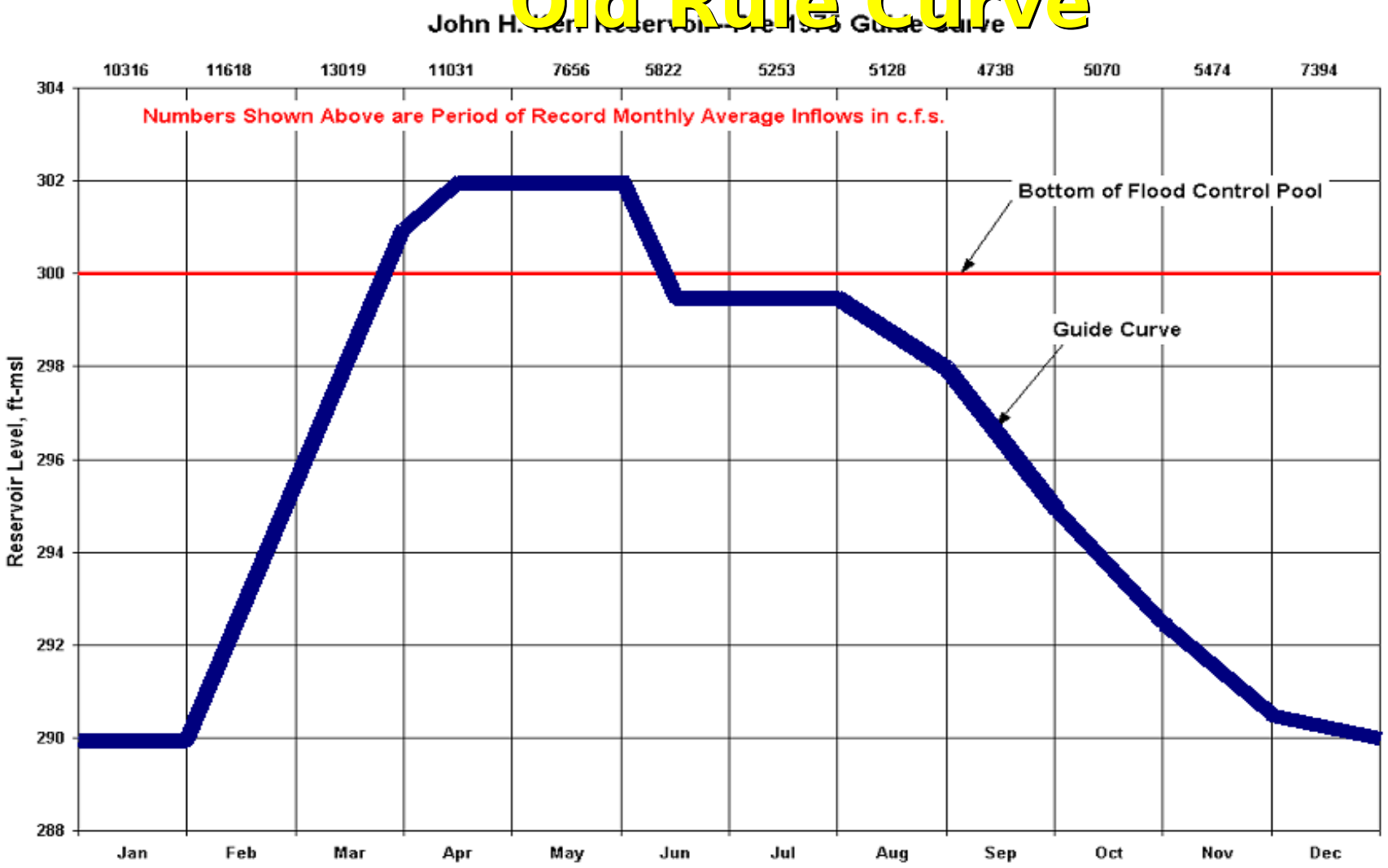
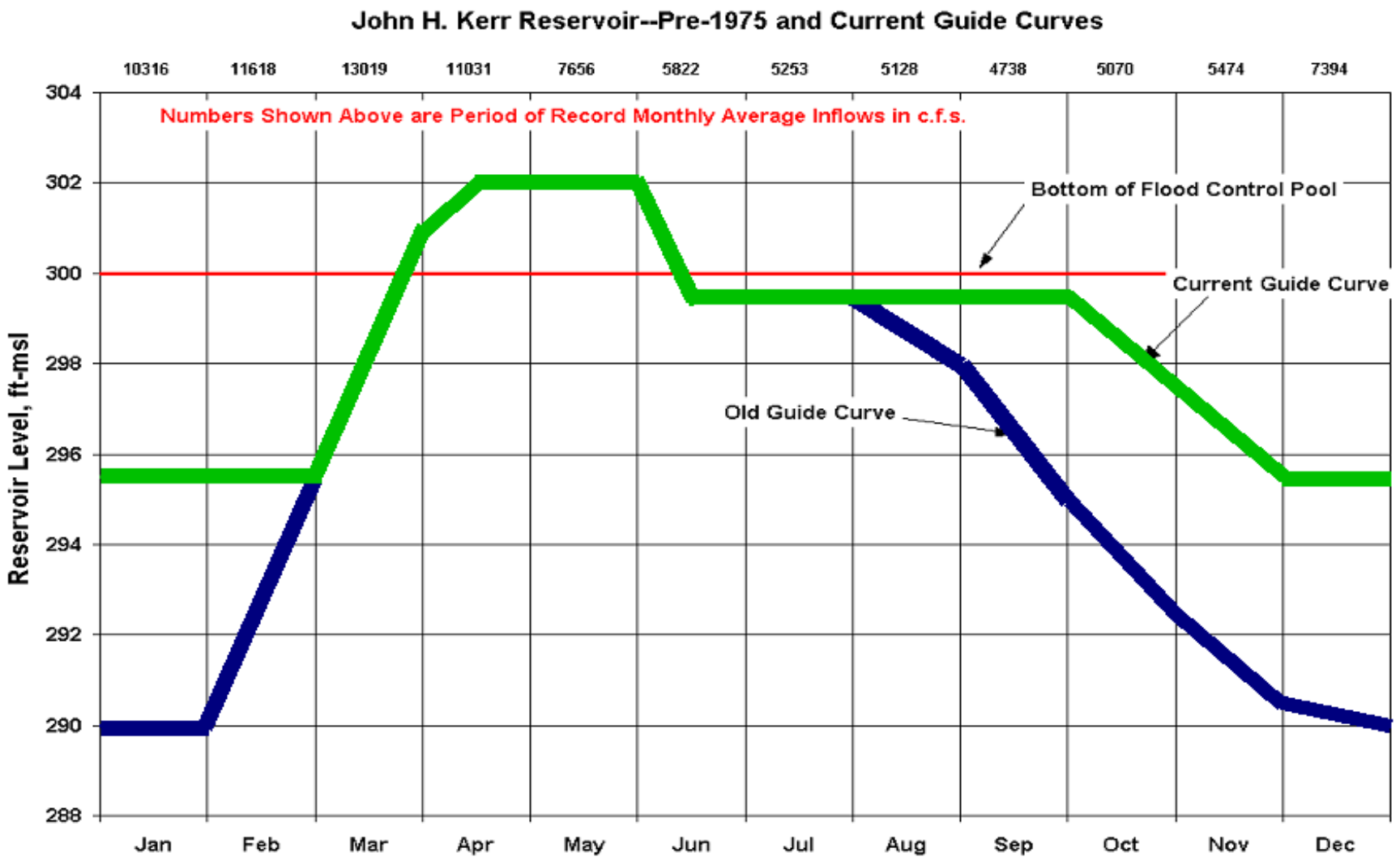
John H. Kerr Dam and Reservoir Project Purposes

- **Flood Control (PL 78-534, Flood Control Act of 1944)**
- **Hydroelectric Power (PL 78-534)**
- **Recreation (PL 78-534)**
- **Water Supply (PL 85-500)**
- **Fish and Wildlife (PL 85-624)**
- **Low Flow Augmentation (PL 78-534) no longer required because of FERC Project license number 2009 for Gaston and Roanoke Rapids**

John H. Kerr Dam and Reservoir
Old Rule Curve

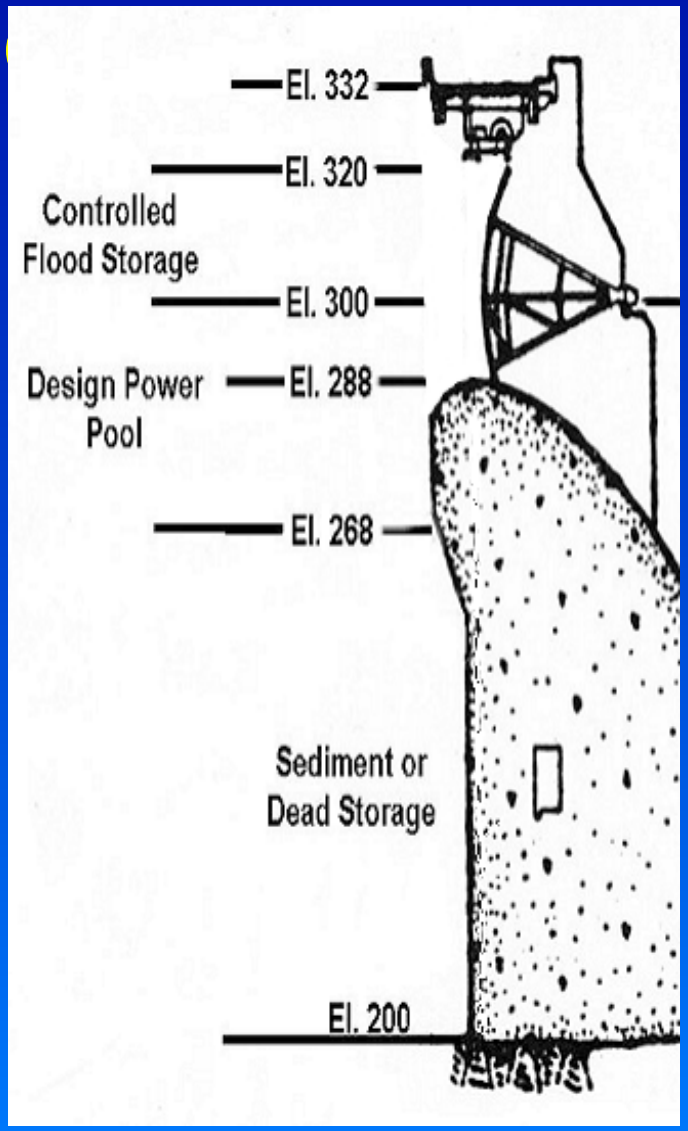


John H. Kerr Dam and Reservoir New Guide Curve and Old Rule



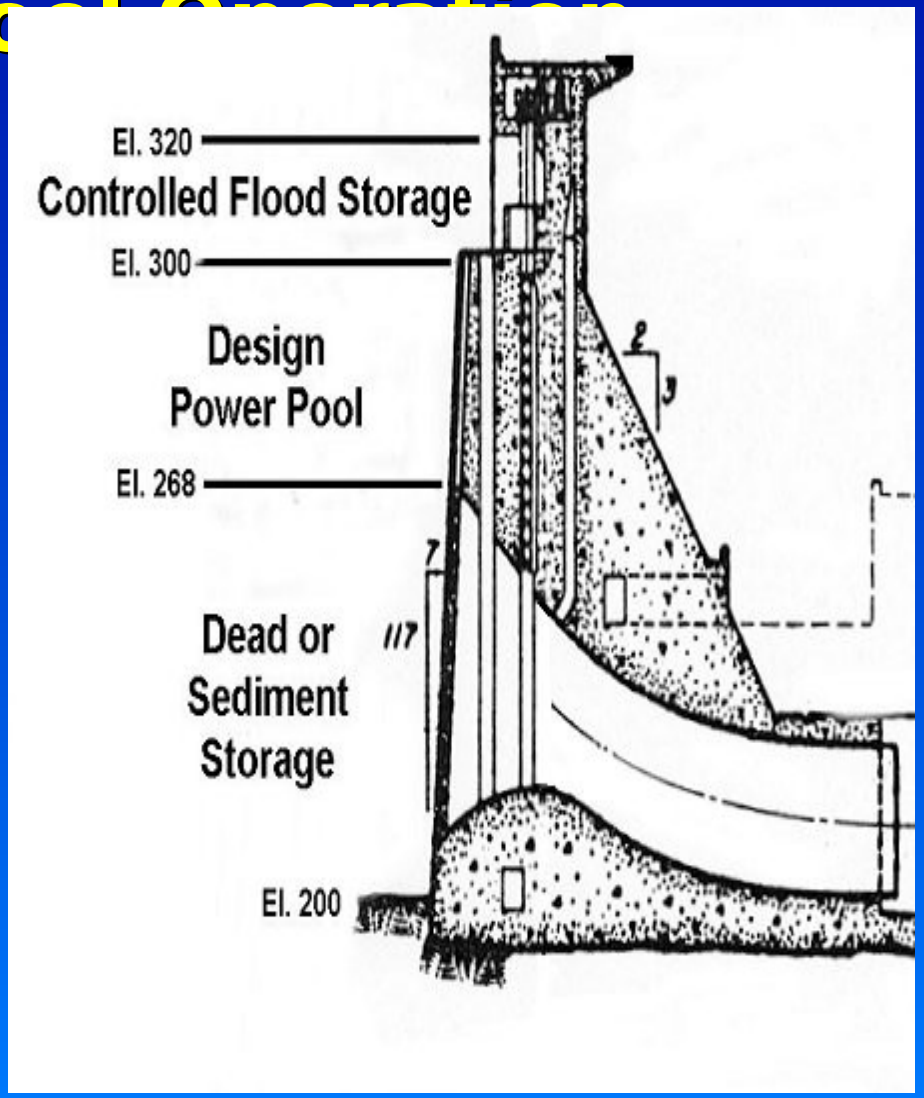
John H. Kerr Dam and Reservoir

Elevation Range	Inches of Runoff	Release at Roanoke Rapids Dam	Comments or Concerns
> 321		100 % of inflow to Kerr Dam	Walkway to Controls at Tainter Gates is at El. 323.25
320 – 321	0.22	85 % of inflow to Kerr Dam	Top of Tainter Gates is at El. 320. Lake Gaston will be surcharged.
315 – 320	0.95	35,000 cfs	Top of Tainter Gates is at El. 320. Lake Gaston may be surcharged. 24 hour courtesy notice is made before releases are made. Timber and farmland impacts and damages.
312 – 315	0.49	25,000 cfs	24 hour courtesy notice may be made. Flooding of timberlands and farmlands. Some damage to farms and crops.
300 – 312	1.64	Up to 20,000 cfs	Interference with timberland and farming interests begins.



John H. Kerr Dam and Reservoir
Power Pool Operation

Elevation Range	Release at Roanoke Rapids Dam	Comments or Concerns
Guide Curve to 300	Up to 8,000 cfs	Typical channel capacity at 8,000 cfs
293 – Guide Curve	Varies	293 is bottom of Turbine Dependable Capacity Limits of 225 MW's
268 - 293	Varies	Turbine Dependable Capacity is not met, but contract energy is met weekly.



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Daily and Weekly Coordination with Agencies, Utilities and Others

- Southeastern Power Administration (SEPA)
- US Geological Survey
- National Weather Service—various offices and the Southeast River Forecast Center
- Dominion Power (Virginia Power Company)
- Appalachian Power Company
- Carolina Power and Light (Progress Energy)
- numerous Water Quality, Fishery and Water Quantity offices in both NC and Va.
- Weekly conference calls and monthly meetings

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Partner—Southeastern Power Administration (SEPA)

- Federal Agency
- Major mission is to market generational capacity and energy generated by Federal reservoir projects.
- Hydropower contracts with preference customers
- To encourage widespread use of generated power
- Provide power to customers at competitive rates
- To recover all costs plus interest on

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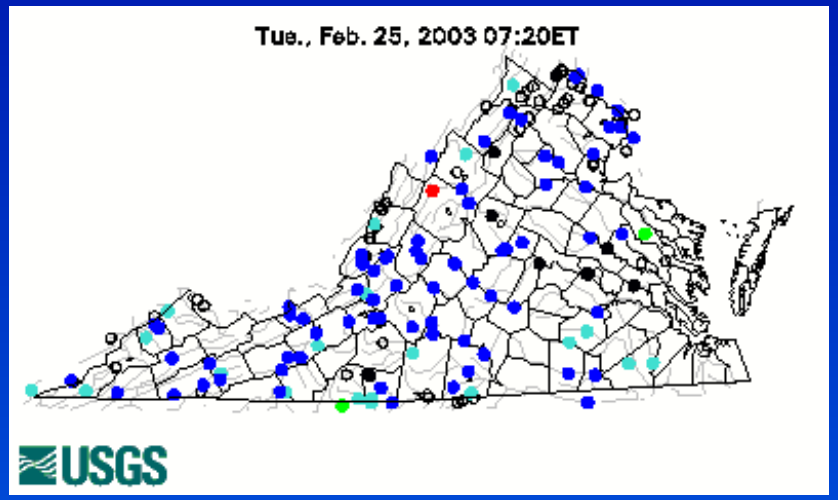
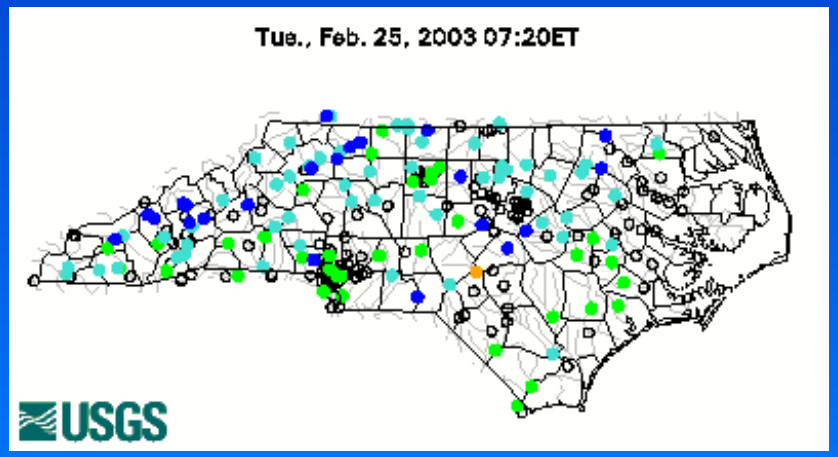
Partner--US Geological Survey

- Real-time coordination with offices in Raleigh and Richmond
- USGS maintains real-time river and stream gage network
- Partnering via Cooperative Stream Gaging Network





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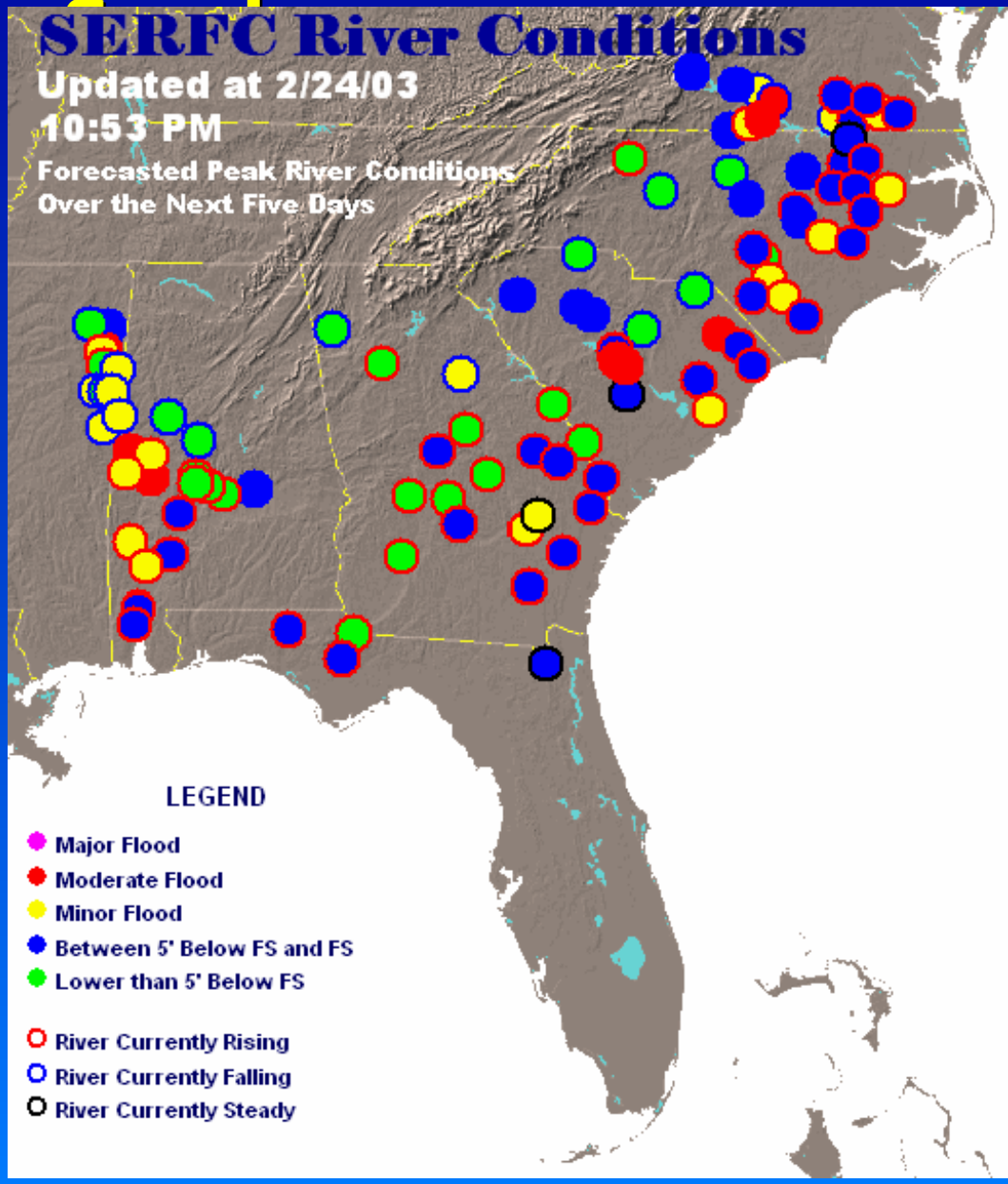
Partner—National Weather

- River Forecast Center—river forecasts for southeastern US
- http://www.srh.noaa.gov/atr/
- Extended (Ensemble) Stream Flow Predictions (ESP)
- Field offices in Raleigh, Blacksburg and other locations that apply local knowledge to weather and river forecasts



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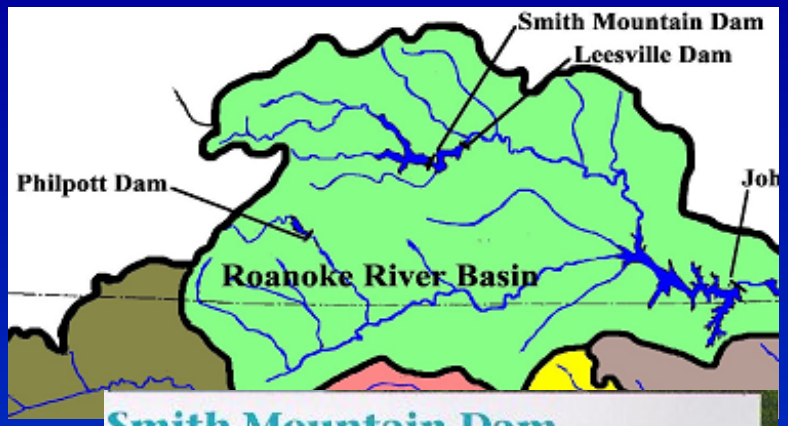
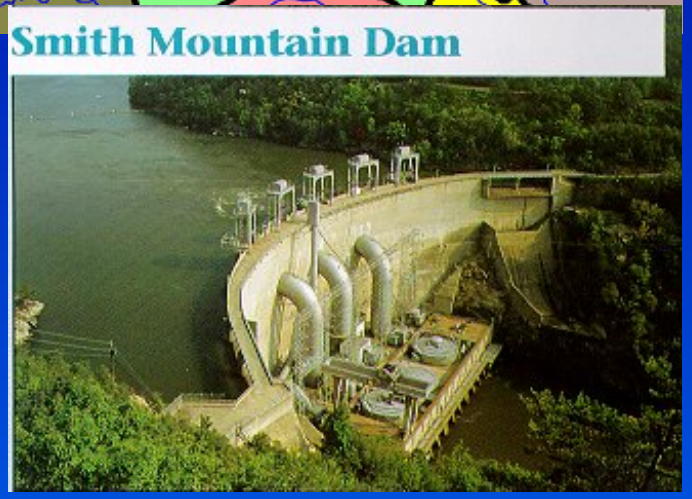
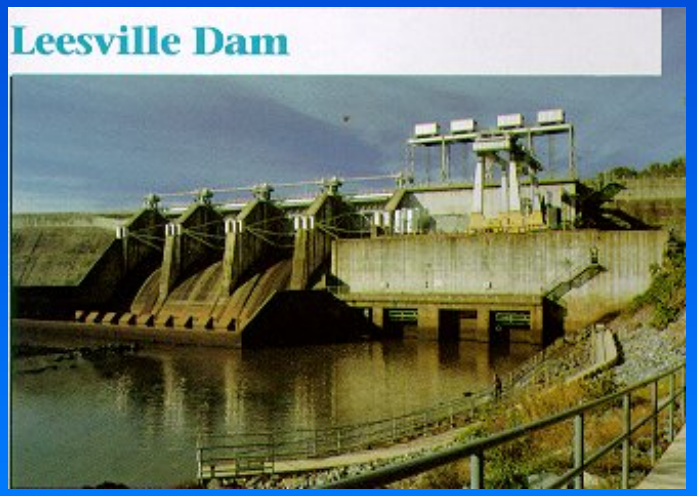
Partner—Appalachian Power Company



- Smith Mountain/Leesville pump storage upstream of Kerr Reservoir on Roanoke River
- Interest during major flood events
- Existing FERC (formerly Federal Power Commission) license allows interaction during flood events via article 29
- have started FERC relicensing process.





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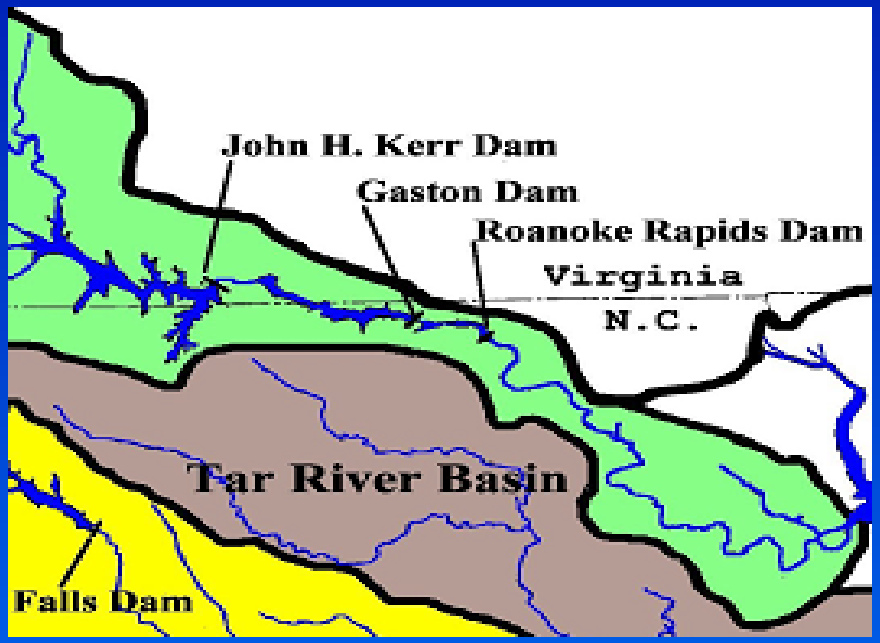
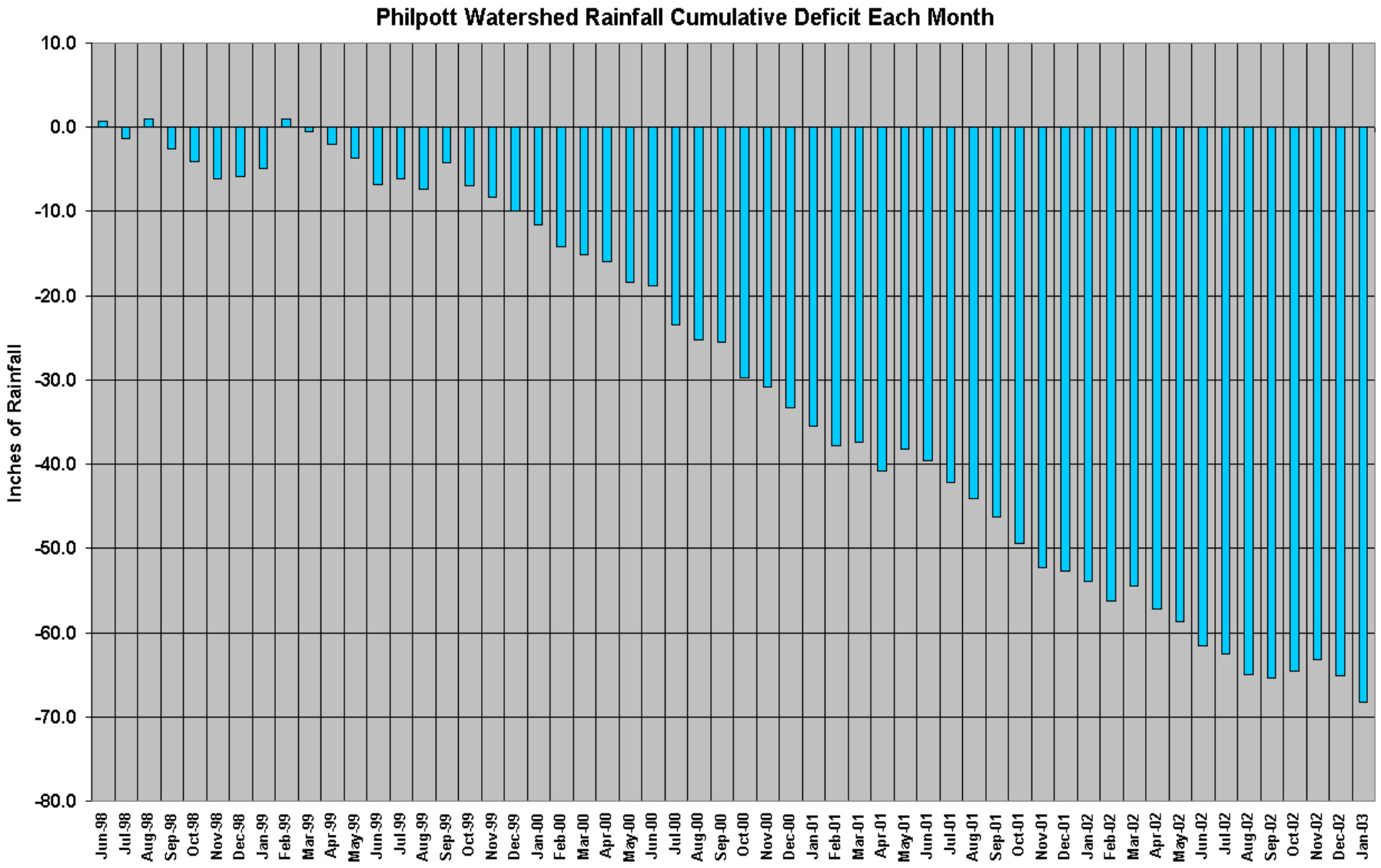
Partner—Dominion Power (Virginia Power Company)

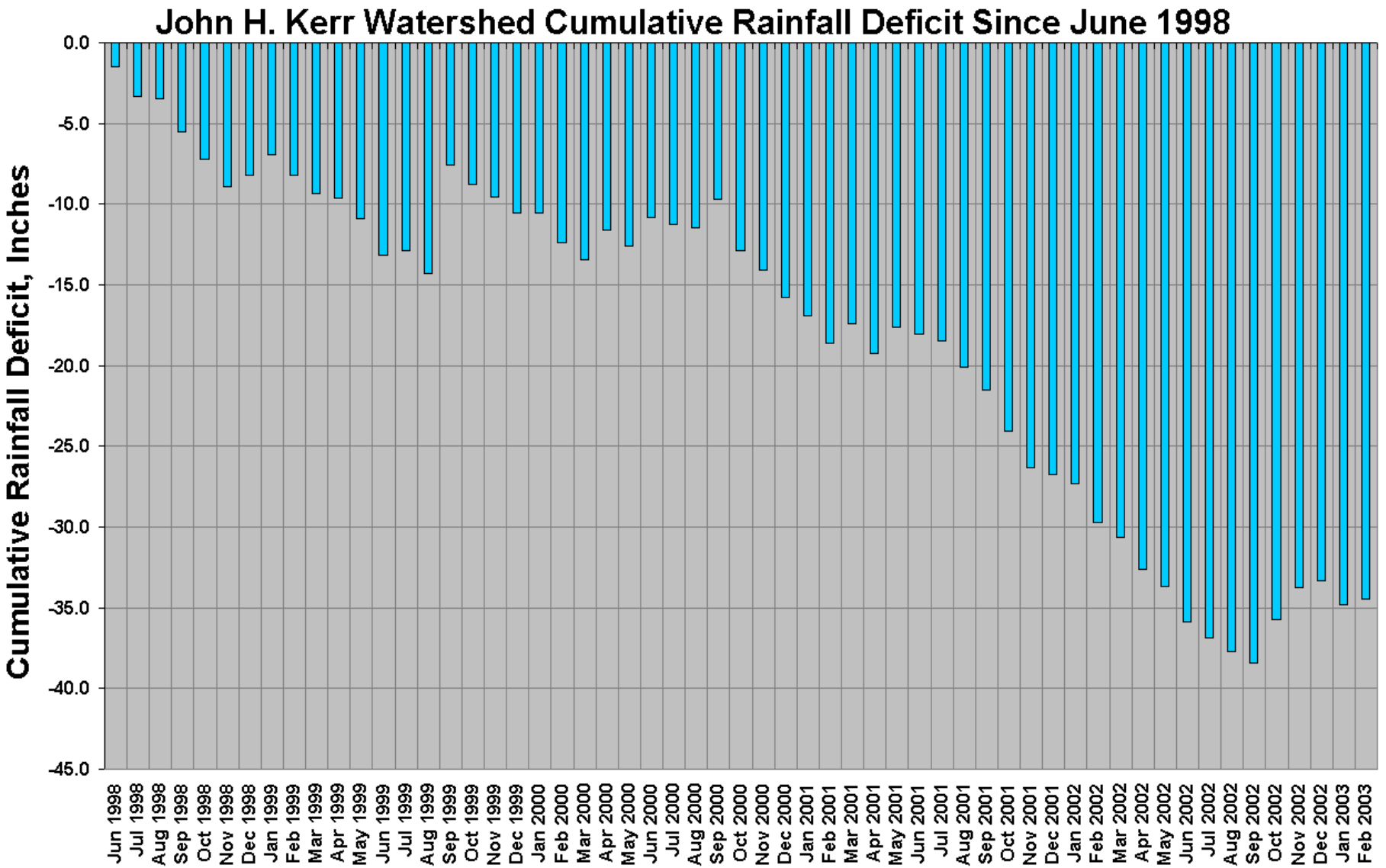
- Close partnering and direction of releases during striped bass spawn season from April 1 to June 15
- COE directs releases during flood events to get water out of the Kerr Reservoir, Gaston, Roanoke Rapids system
- FERC relicensing process is ongoing



Philpott Dam and Lake



John H. Kerr Dam and Reservoir



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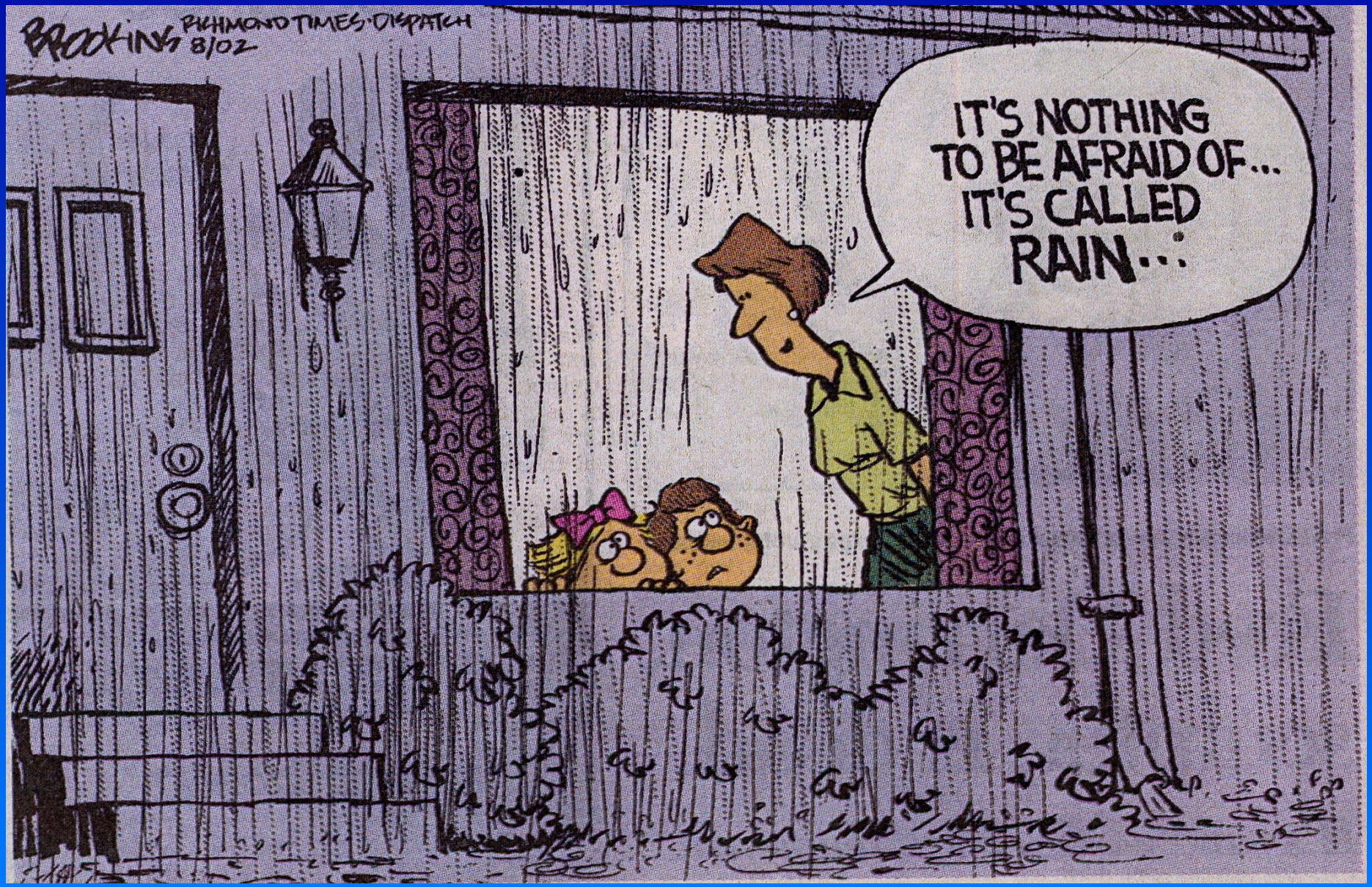
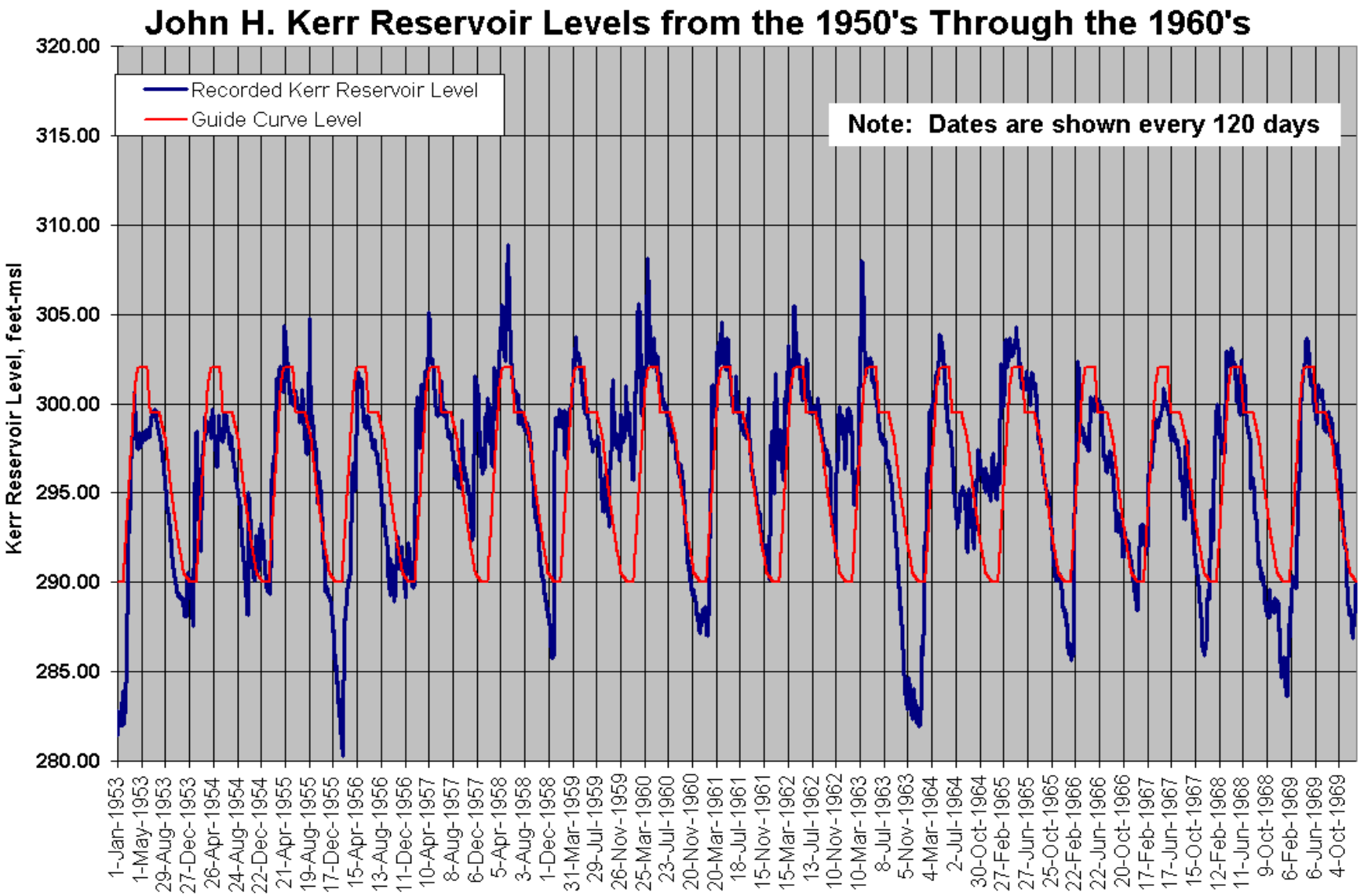


John H. Kerr Dam

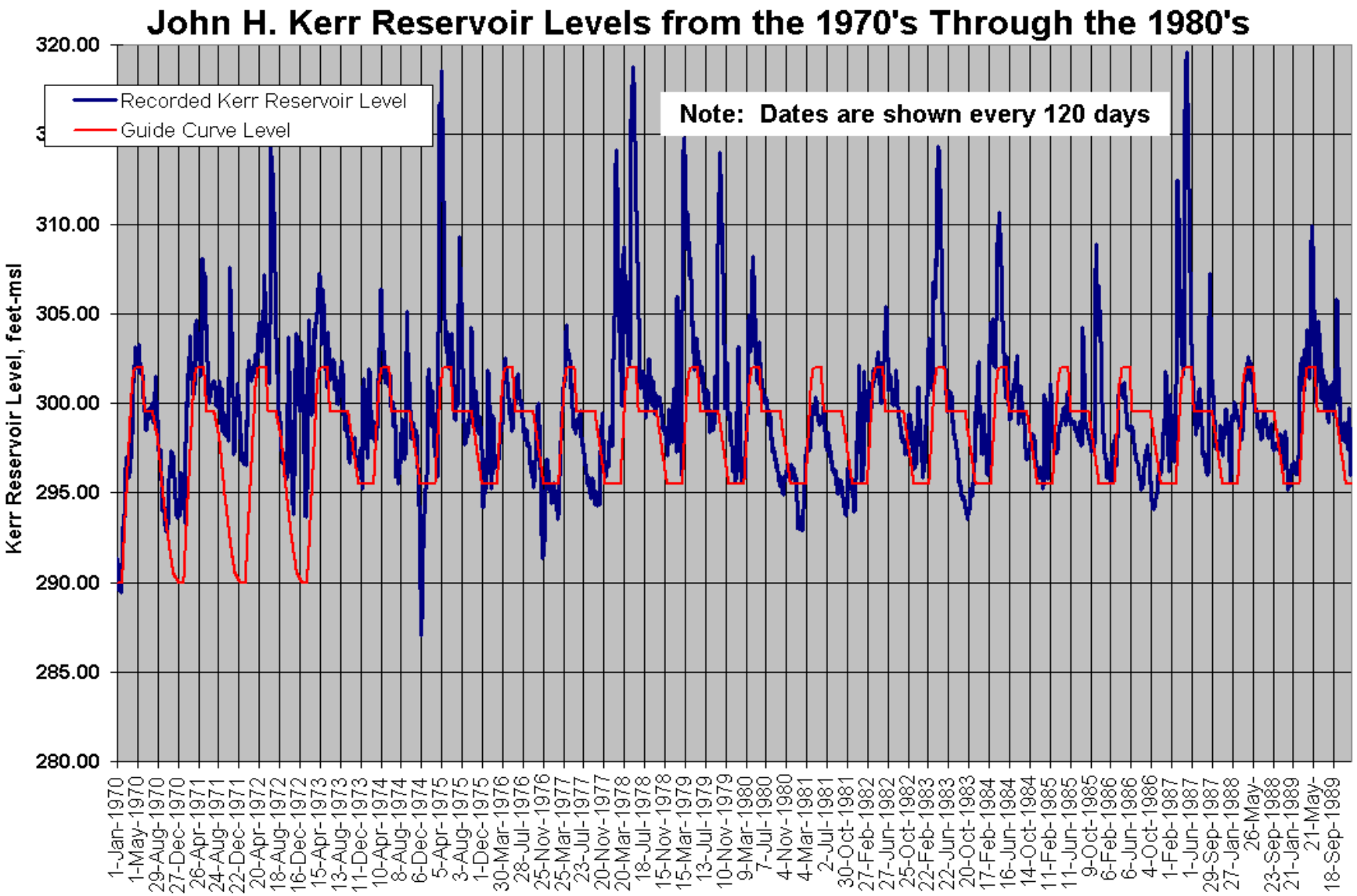
Recent Average Monthly Inflow Ranking Compared to Historic Inflows since 1930

Month	Rank
Oct. 2001	1 (17% of normal)
Nov.	1 (21% of normal)
Dec.	1 (26% of normal)
Jan. 2002	5
Feb.	1 (21% of normal)
Mar.	4
Apr.	1 (22% of normal)
May	11
June	1 (14% of normal)
July	1 (13% of normal)
Aug.	1 (12% of normal)
Sept.	10 (30% of normal)

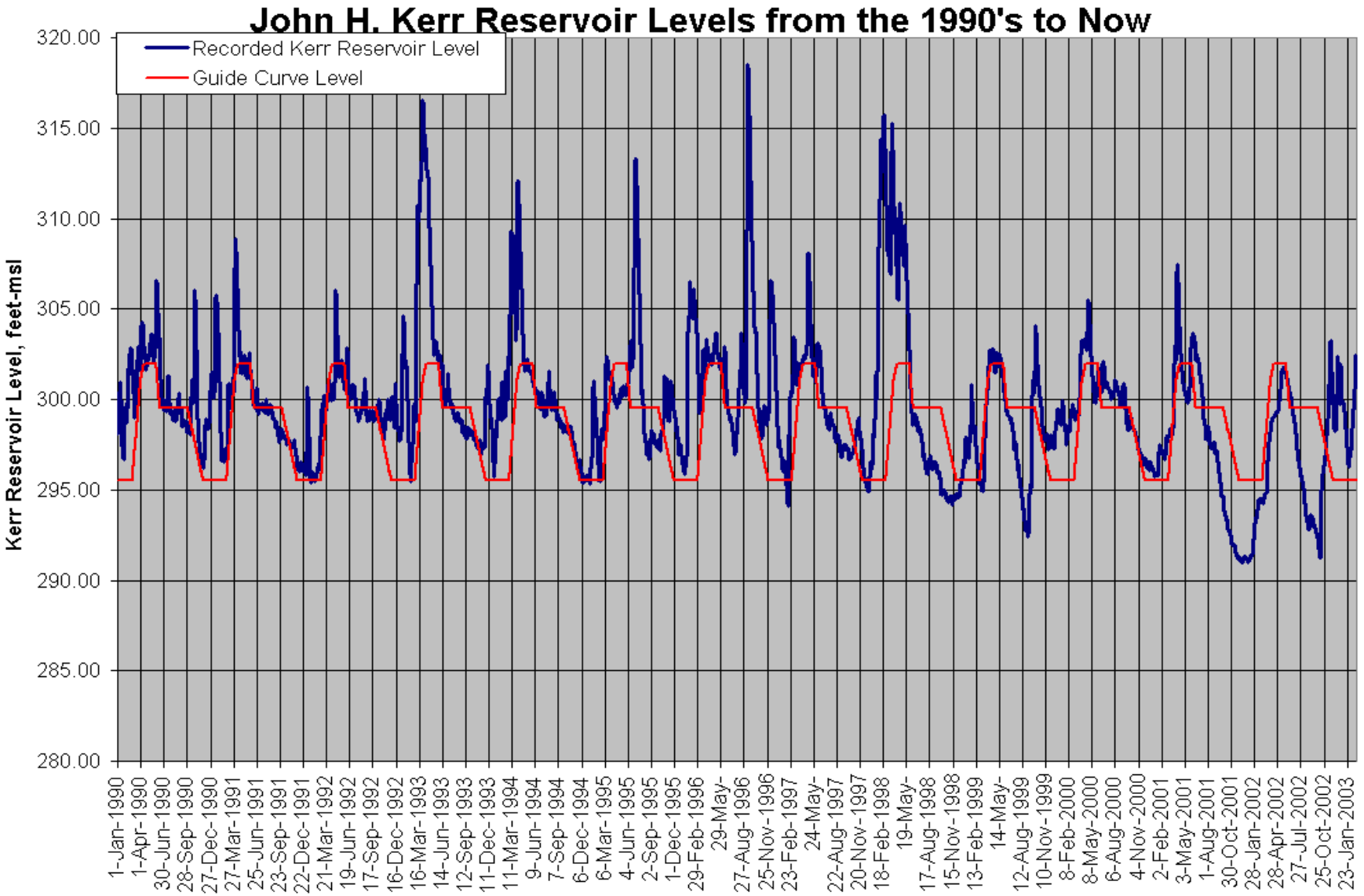
John H. Kerr Reservoir—1953 through 1969



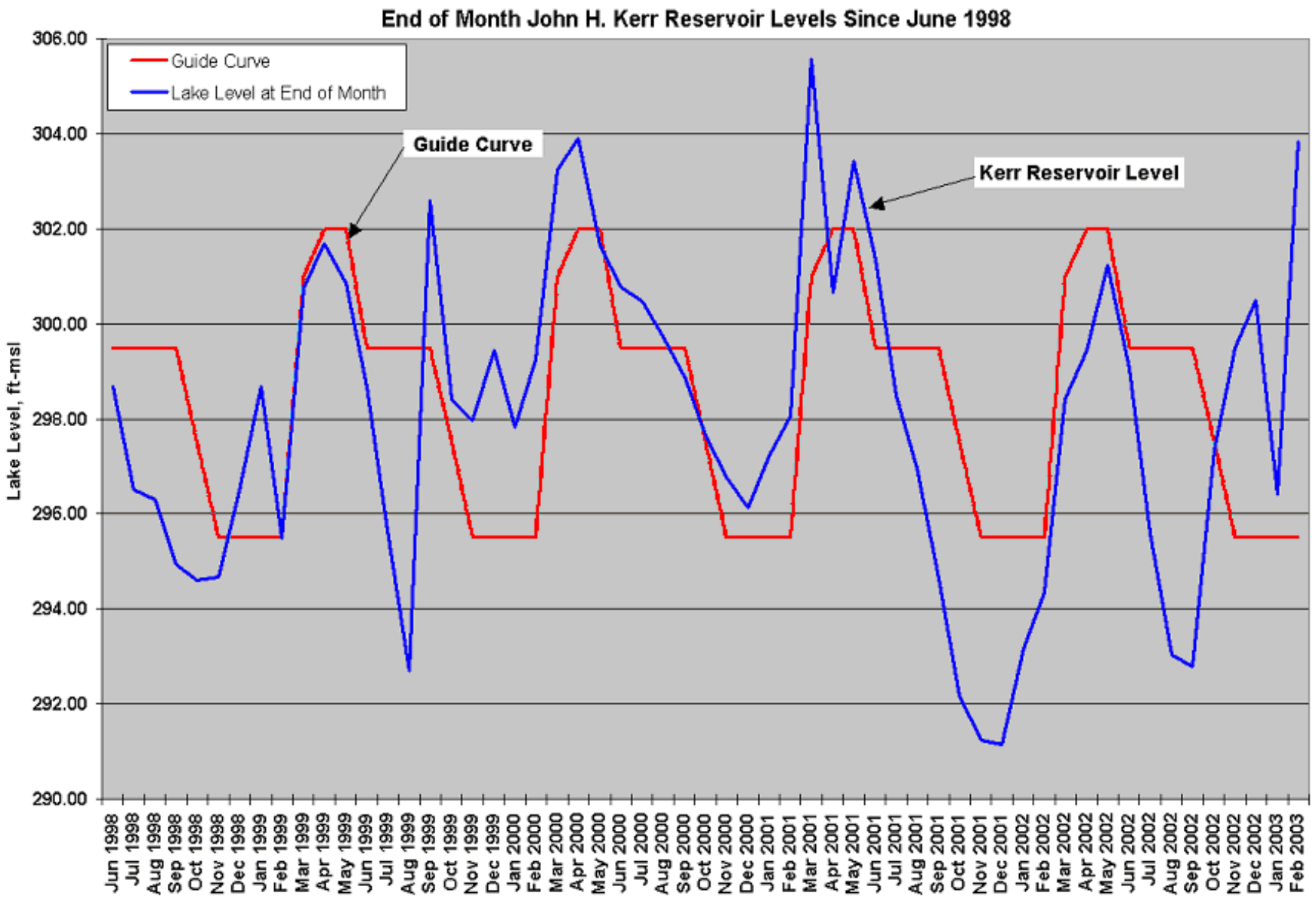
John H. Kerr Reservoir—1970 through 1989



John H. Kerr Reservoir—1990 to Now



John H. Kerr Dam



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Drought Responses

Drought Management Committee

Partnering together (a success story in progress)

- Per the 1992 Drought Management Plan for John H. Kerr, monthly meetings were started in October 2001
- Started weekly conference calls in early 2002
- Participants represented a diverse background of experiences, concerns and responsibilities—both upstream and downstream.

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Drought Responses

Drought Management Committee

- **Who were typical participants in meetings and conference calls, (continued)?**
  - Lake Gaston Association
  - The Public
  - Roanoke River Basin Association
  - Cities including Clarksville and Henderson
  - Counties around Kerr Reservoir and Lake Gaston
  - Private businesses such as marina operators on Kerr
  - Industries such as Weyerhaeuser in the lower Roanoke

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Drought Responses

Drought Management Committee

- **Who were typical participants in meetings and conference calls representing the Roanoke?**
  - Virginia Dept. of Water Quality
  - Virginia Dept. of Fisheries
  - NC Dept. of Water Resources
  - NC Dept. of Water Quality
  - NC Wildlife Resources Commission
  - National Weather Service and the NC Climatology Office
  - US Geological Survey
  - Dominion Power Company (formerly VPCO)

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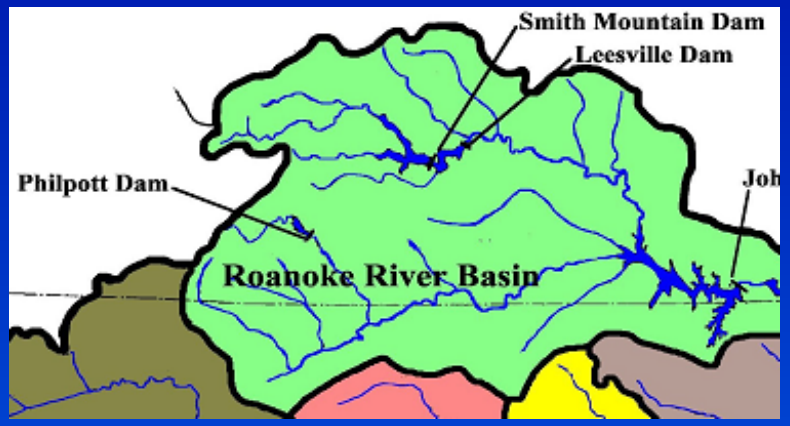
Drought Responses

Drought Management Committee



Upstream Challenges

- Keep the lake level up for recreational needs and tourism dollars
- Deal with record low inflows and below average releases from reservoirs upstream
- Keep the lake level up for Henderson, Clarksville and other water supply intakes—over 50,000 water supply customers in Henderson alone
- Need to keep lake at normal levels for efficient hydropower generation for preference customers

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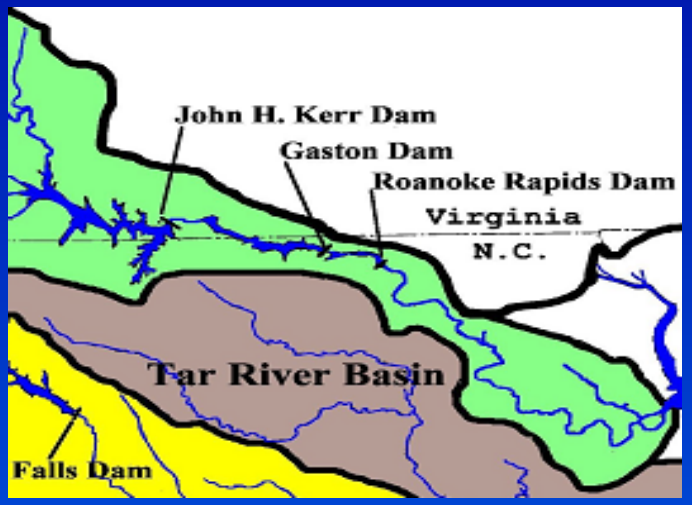
Drought Responses

Drought Management Committee



Downstream Challenges

- Provide flows for non-lethal habitat for fish
- Provide flows for striped bass spawn from April to June 15
- Provide flows for Weyerhaeuser operation at Plymouth, NC—1500 direct employees, thousands of indirect workers. Saltwater wedge was the primary operational issue.
- Provide flows for waste load allocation permits.
- Keep the lower Roanoke River area attractive for tourism dollars

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Drought Responses

Strategy

- All stakeholders actively participate in weekly conference calls and monthly meetings.
- Participants report observations and make recommendations.
- Releases from Philpott, Kerr and Roanoke Rapids Dams methodically cut back and observing any impacts.
- Very close monitoring of water quality conditions including dissolved oxygen and salt water wedge.
- SEPA would buy replacement power to replace what was not being generated for customers in North Carolina and Virginia. This was to avoid potential brown or black outs.
- Water supply users basin wide were to reduce consumption

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Drought Responses

Successes

- Henderson—able to get water as needed. Upgrading water intake for when Kerr Reservoir gets low again.
- Weyerhaeuser continued operation at Plymouth, NC. Salt water wedge was constantly a threat but closely monitored.
- SEPA bought $1.3 million in replacement electricity to replace what was not being generated at Kerr Dam. Kerr Reservoir would have been much lower otherwise. Additionally, no brown or black outs resulted.
- Tourism and recreation was heavily impacted, but impact could have been much worse.
- Water quality conditions were “off”, but no fish kills resulted. Striped bass spawn JAI was above

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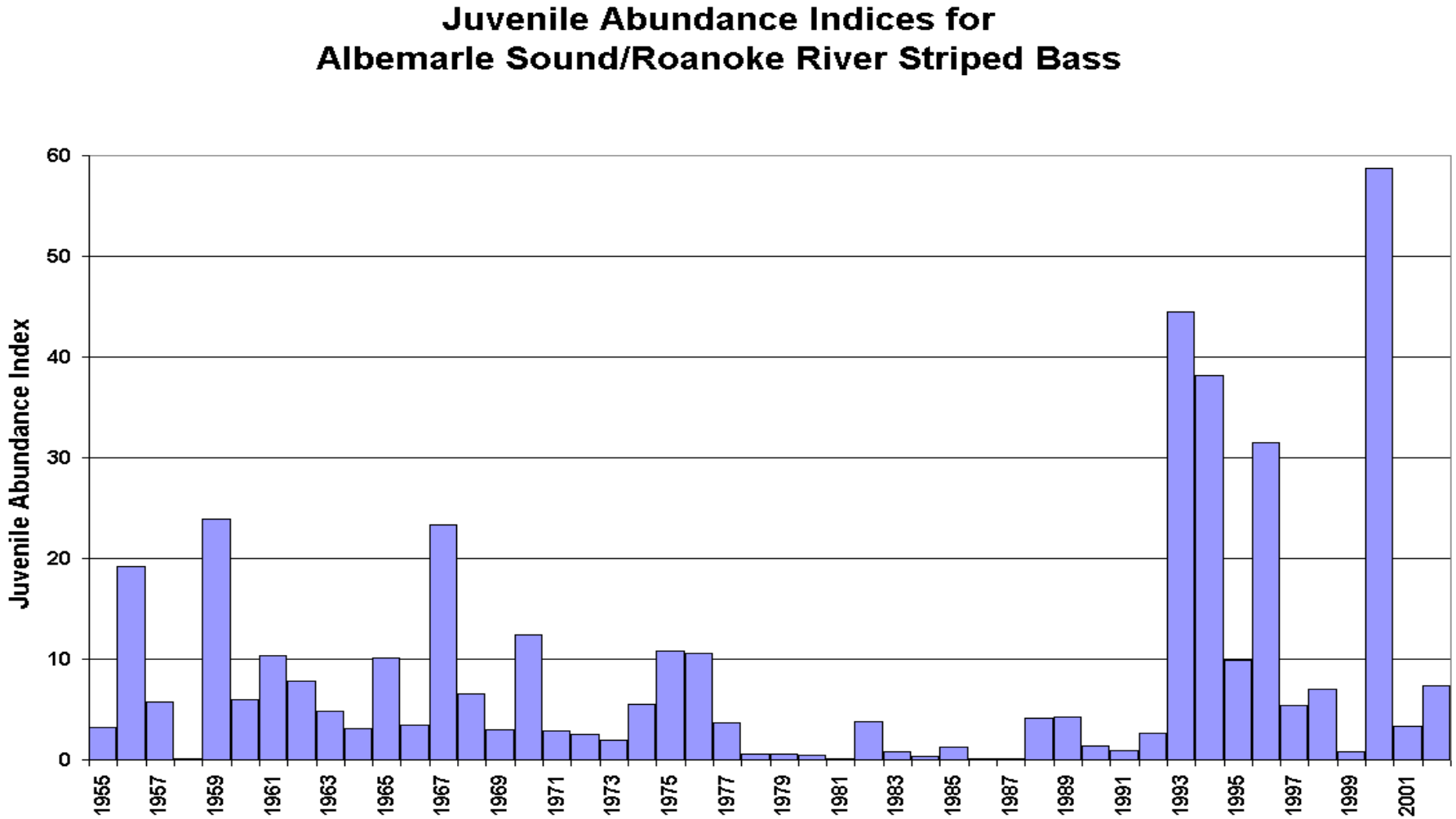
John H. Kerr Dam and Reservoir



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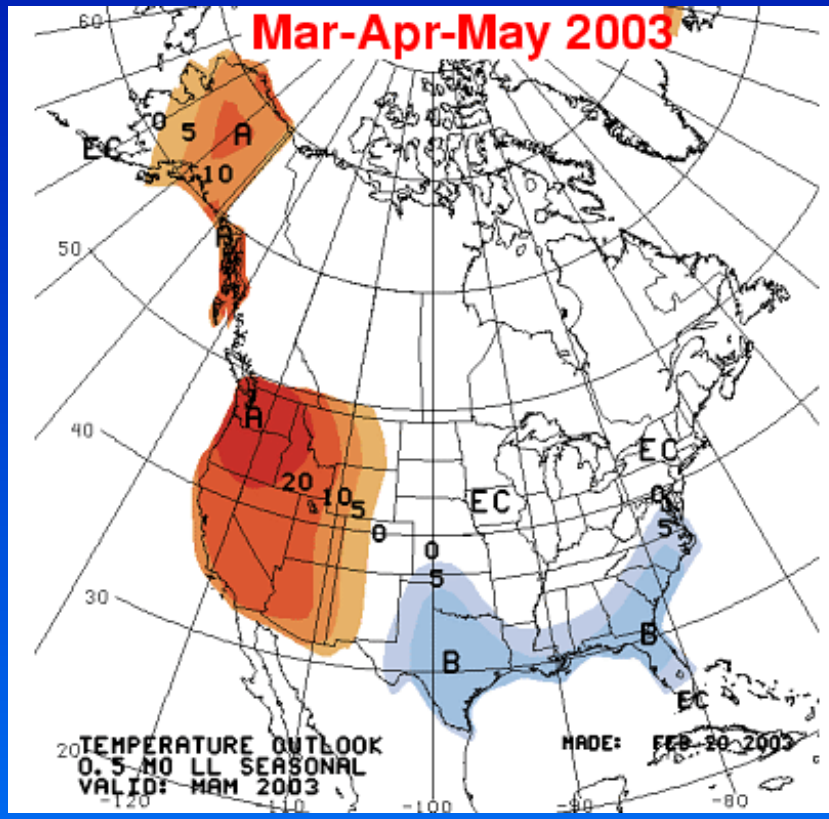
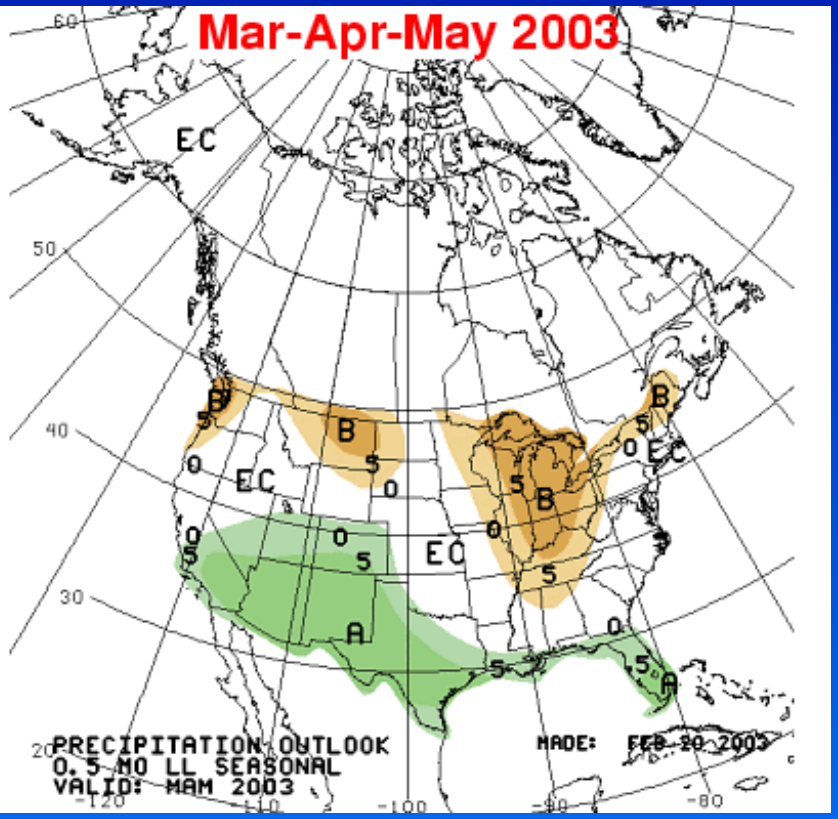
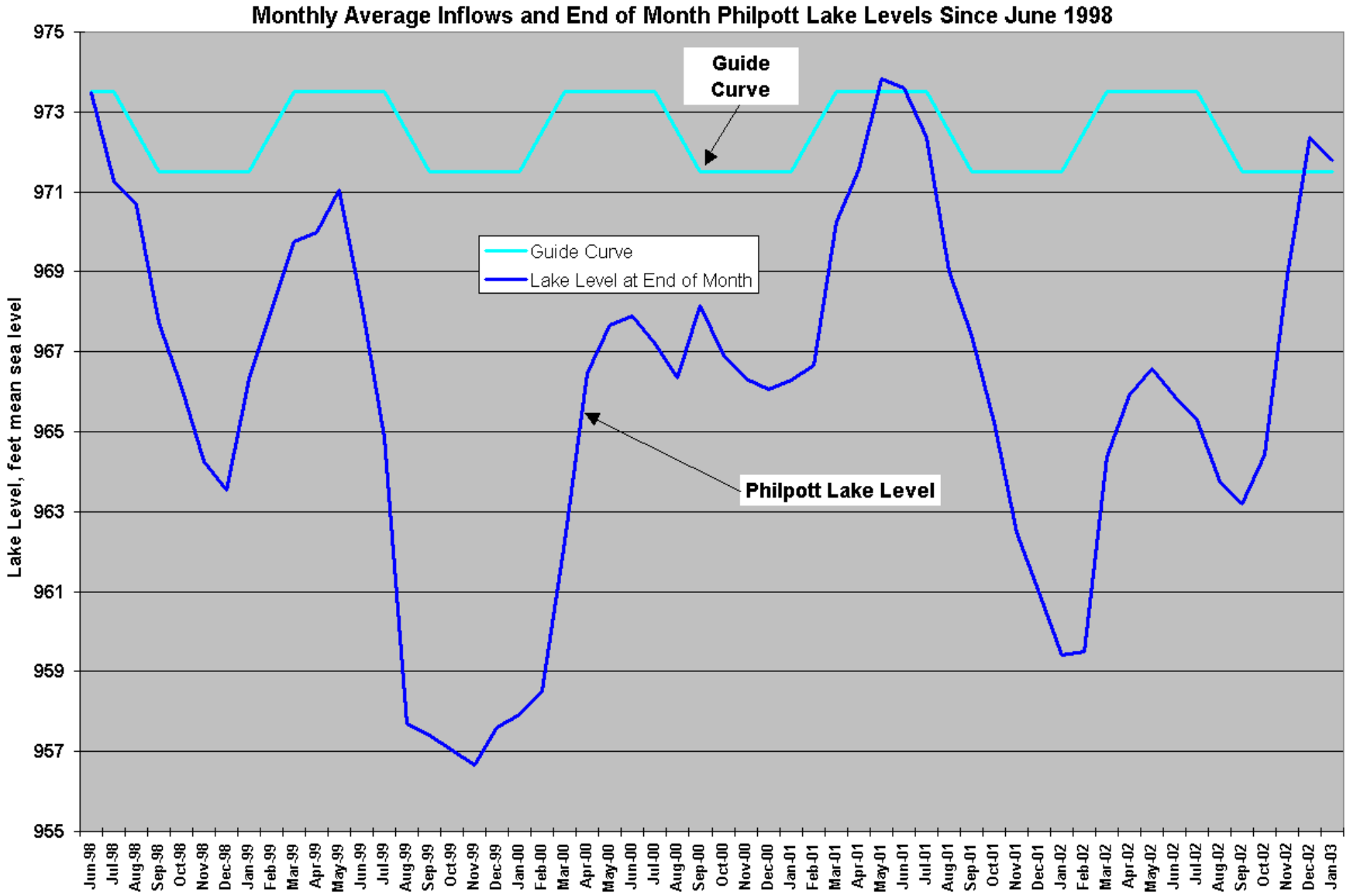
NOAA March Through May 2003 Temperature and Rainfall Forecast





AT LEAST THESE ARE DOING OKAY...
YEAH, BUT THEY'RE SUPPOSED TO BE SOYBEANS.

Philpott Dam and Lake



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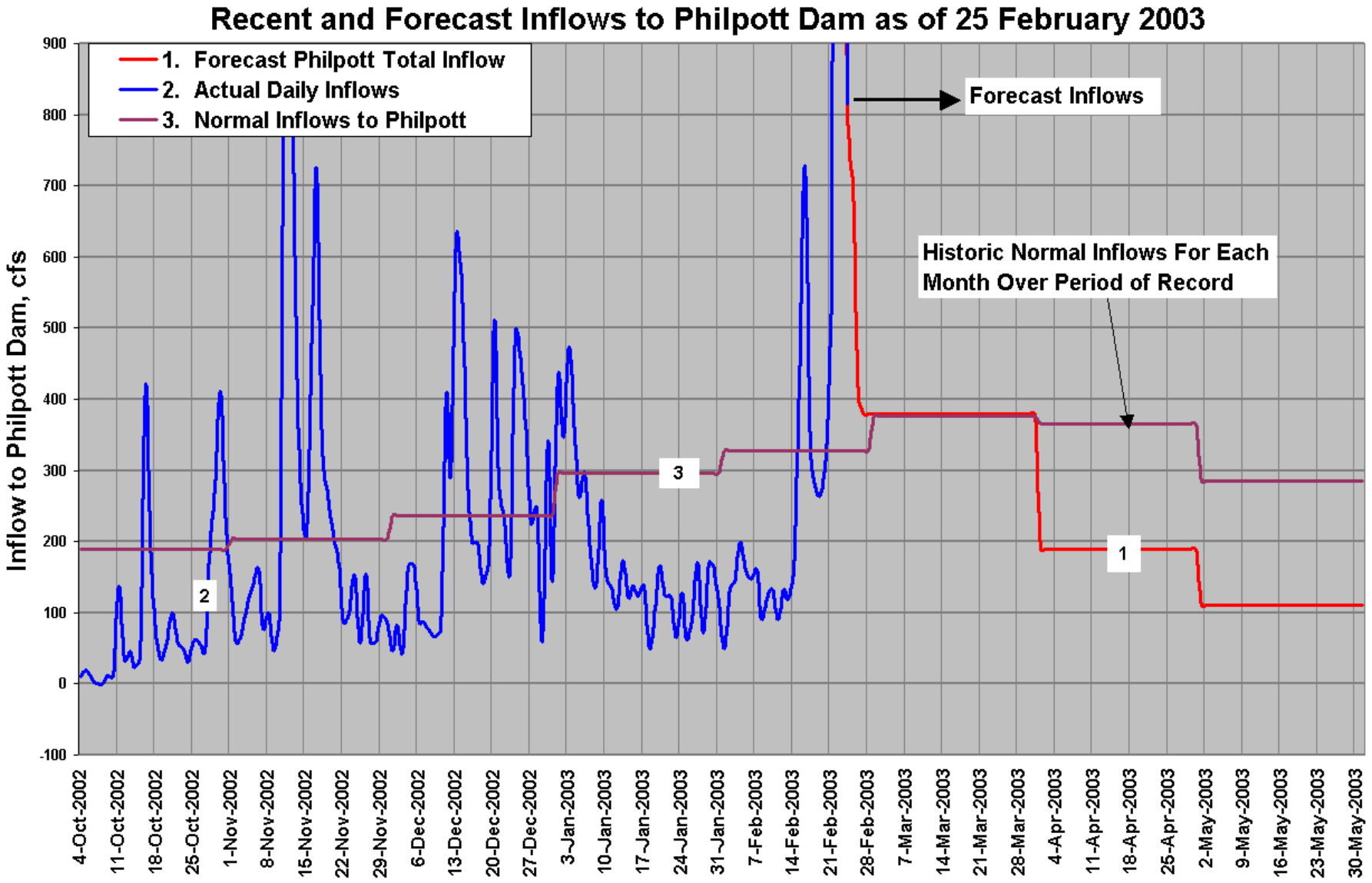

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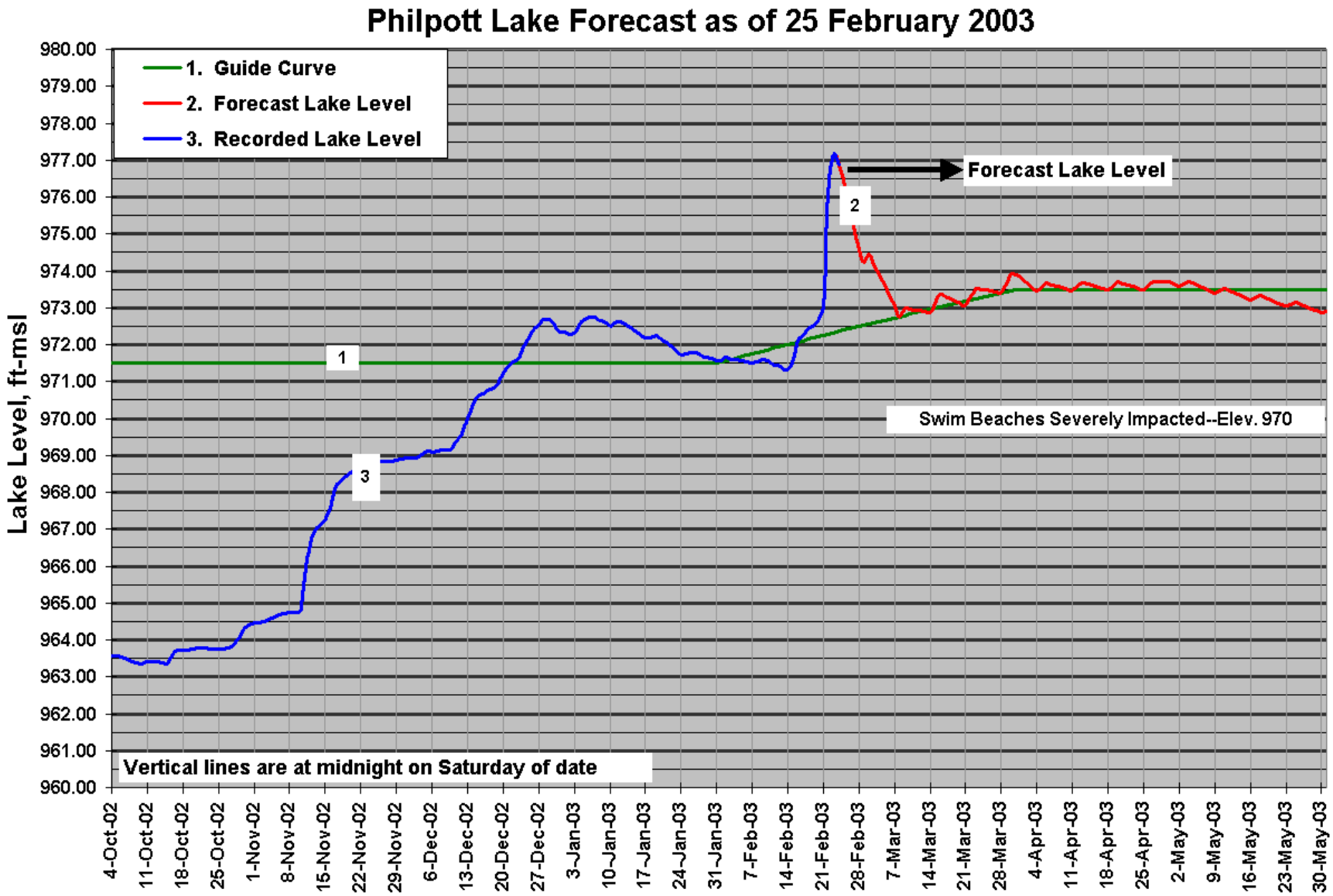
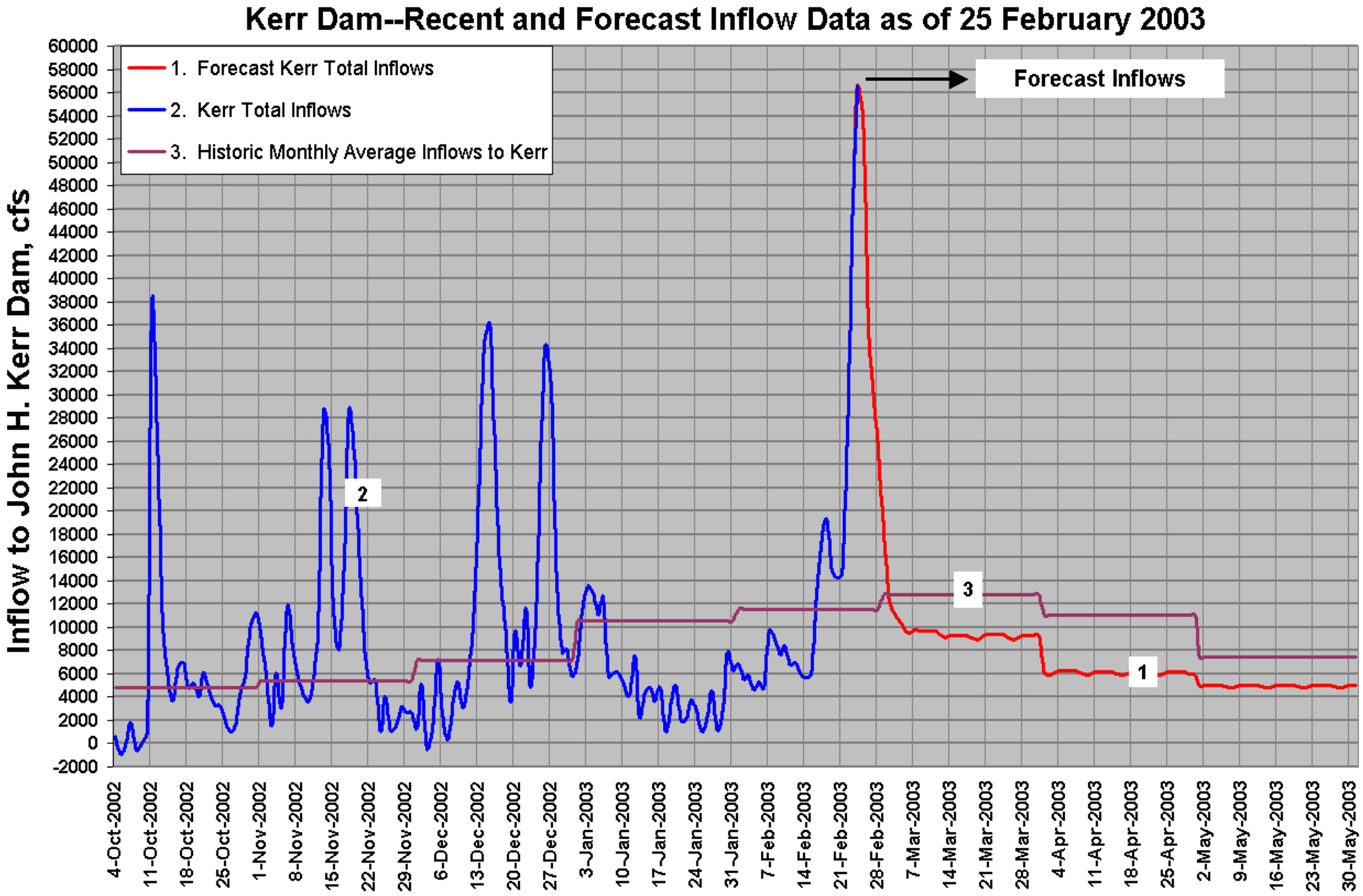


John H. Kerr Dam



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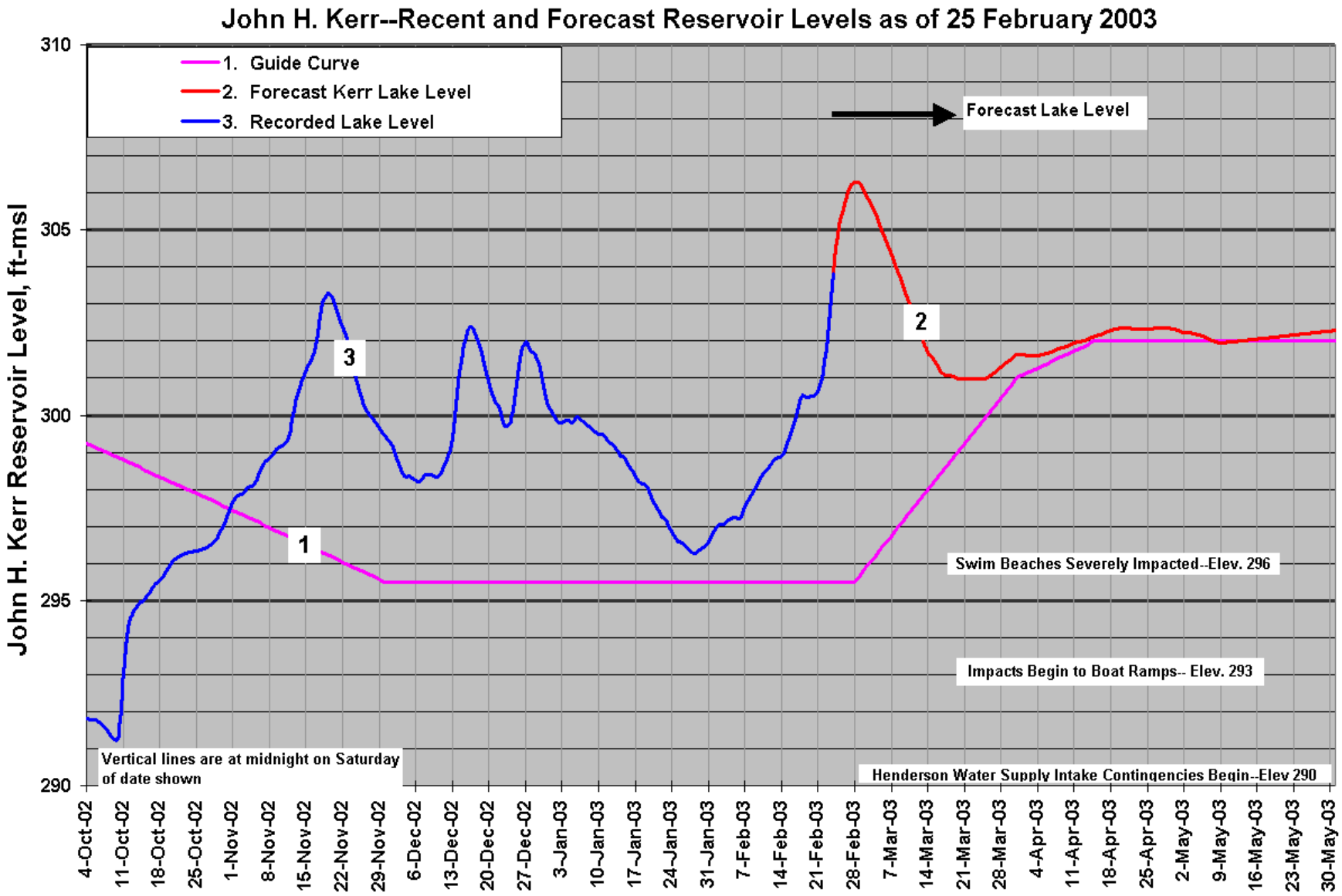

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Philpott and John H. Kerr Project Accomplishments

Flood Damages Prevented

- Kerr: $390,852,800 total since filling
- Philpott: $346,205,000 total since filling

Average Annual Hydropower Generation

- Kerr: 433,817,800 kWH Philpott: 25,919,049 kwh

Typical Annual Recreational Visitation

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Drought Reports on Line

Wilmington District Drought Web site has

- projected lake levels,
- boat ramp status,
- public affairs news items,
- drought reports,
- drought links,

This information can be found at:

http://epec.saw.usace.army.mil/drought/main.htm

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